User Guide

FIP-400

Fiber Inspection Probe

www.EXFO.com

Telecom Test and Measurement

EXFO

EXPERTISE REACHING OUT

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Units of Measurement

Units of measurement in this publication conform to SI standards and practices.

Version number 1.0.0.

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Certification Information

F.C.C. Information

Electronic test equipment is exempt from Part 15 compliance (FCC) in the United States. However, compliance verification tests are systematically performed on most EXFO equipment.

CE Information

Electronic test equipment is subject to the EMC Directive in the European Union. The EN61326 standard prescribes both emission and immunity requirements for laboratory, measurement, and control equipment. This unit has undergone extensive testing according to the European Union Directive and Standards.

1 Introducing the FIP-400 Fiber Inspection Probe

The FIP-400 Fiber Inspection Probe is a portable video microscope used to inspect fiber ends. Unlike traditional microscopes, the FIP-400 facilitates the examination of patchcord connectors and also hard-to-reach connectors on the back of patch panels and bulkhead adapters.

Probe

The FIP-400 is designed to be an intuitive, easy-to-use piece of equipment. This video microscope is used for inspecting fiber ends.

- The *focus knob* can be turned in either direction to focus the image.
- The *zoom button* allows you to shift between two levels of magnification.
- The *freeze/capture button* is used together with portable units such as the FOT-930 and the AXS-100. You can also use it with the EXFO USB adapter and your computer or your FTB-400. It allows you to freeze and unfreeze the video, and to capture and store images on your computer.
- The *retaining nut* holds tips securely in place, ensuring they are always fastened in the correct position.
- The *fold out clip* at the back of the probe allows you to hang the probe when you are not using it.

The probe comes equipped with a protective cap that fits over basic tips; therefore, you do not need to remove the tip before putting the cap on.

Probe Tips

The FIP-400 comes with two interchangeable tips but other models are also available.

The tips included with the Fiber Inspection Probe are used to inspect flat polish (PC) 2.5 mm connectors. One tip allows you to inspect patchcords (pigtails, male connectors) for SC, FC, and ST connectors. The other tip is used for examining SC and FC bulkhead adapters or patch panel adapters (female).

Other tip models are available for various bulkhead adapters and patchcord connectors including multifiber types. For more information about tips and their use, visit the EXFO Web site at www.EXFO.com.

FIP Viewer (Optional)

You can use the FIP Viewer with your Fiber Inspection Probe to inspect a fiber end. The unit operates with an AC charger/adapter or a lithium-ion battery.

LED Description

The two LEDs located on the front of the FIP Viewer provides you with the status of your unit.

Operation status LED

LED	Status
Green	Probe connected
Flashing red	Probe not connected

Battery status LED

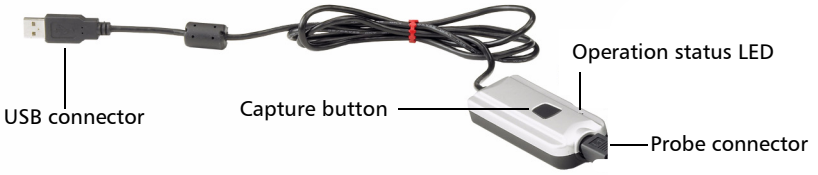
LED	Status
Green	Full battery and AC charger/adapter connected
Flashing green	Charging battery
Yellow	Low battery
Red	Battery error

Note: *If the battery is not full, the AC charger/adapter can support the operation and charge the battery at the same time.*

USB Adapter (Optional)

The USB adapter is used to connect the probe to a computer or a unit not equipped with a 8-pin connector. It allows you to view probe images on your computer screen or on an inspection unit equipped with a built-in screen. You can also capture and store these images on your computer to document your work.

Note: *You can use a USB adapter 1.1 if your unit or computer is not compatible with the USB adapter 2.0.*



- The *Capture button* on the USB adapter serves the same function as the capture button on the probe.
- The Status *LED* on the USB adapter will be green when the probe, USB adapter, and computer are properly connected and the software is running.

Conventions

Before using the product described in this manual, you should understand the following conventions:

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in *death or serious injury*. Do not proceed unless you understand and meet the required conditions.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in *minor or moderate injury*. Do not proceed unless you understand and meet the required conditions.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in *component damage*. Do not proceed unless you understand and meet the required conditions.

IMPORTANT

Refers to information about this product you should not overlook.

Note: *The screen shots found in this user guide were made on a computer running Windows XP. Appearance of the application may vary for other operating systems.*

2 Setting up Your Fiber Inspection Probe

Selecting the Language of Operation

You may display the user interface in one of the available languages (default is English). Values are kept in memory when you turn off the unit.

To select a new interface language:

1. From the **Tools** menu, select **Language Settings**.

   Modify the settings.

Language Settings
Use system language (English if not available)
Use the following language:
English (United States)
Changes to language settings will be applied next time you start the application.
OK
Cancel

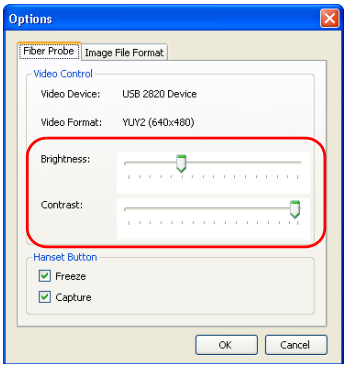
2. Click **OK**.

Adjusting Brightness and Contrast

You can adjust brightness and contrast for video.

To adjust brightness or contrast:

1. From the **Tools** menu, select **Options**.
2. From the **Fiber Probe** tab, move the brightness or contrast sliders to adjust the values.



Note: *The resolution of the video and captured images is set to 640x480. This value cannot be modified.*

3. Click **OK**.

Configuring the Default Storage Parameters

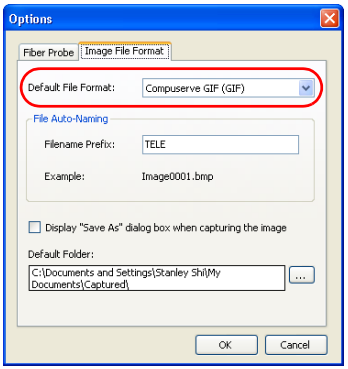
You can define the storage parameters such as the default file format, the filename and the default folder corresponding to your needs.

Each time you save an image, the application suggests a file name based on autonaming settings and a default file format (BMP, JPG, PNG, or GIF).

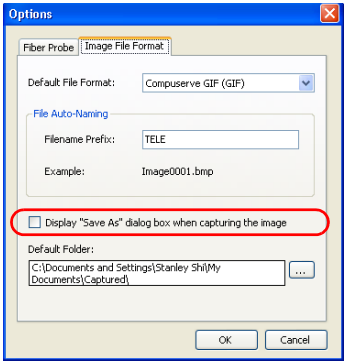
The file name of the images consists of a prefix and a sequential number. You can define the file name prefix but the application will automatically set the sequential number, starting from 0001. For example, if the prefix is defined as “Image”, the saved image files will be automatically named as *Image0001*, *Image0002*, *Image0003*, etc.

To set the storage parameters:

1. From the **Tools** menu, select **Options**.
2. Select the **Image File Format** tab.
3. If necessary, from the **Default File Format** list, select the desired file format.



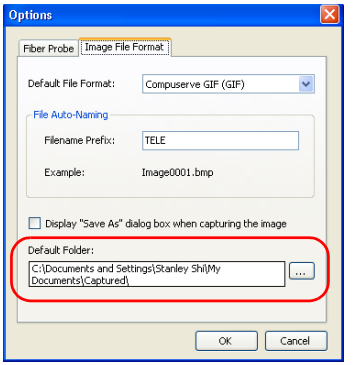
4. In the **Filename Prefix** box, enter the desired file name.
5. If you want to confirm the file name each time you click **Capture**, select **Display "Save As" dialog box when capturing the image**.



OR

If you don't want to confirm, clear the check box.

6. From **Default Folder**, select the location to save images.



7. Click **OK**.

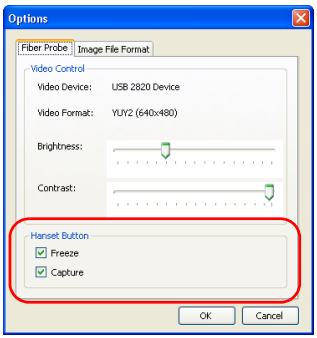
Configuring the Fiber Inspection Probe Button

Instead of having to use the freeze and capture features from the application, you can configure the button located on your Fiber Inspection Probe to automatically perform one of the following actions:

- Freeze: Interrupt the video to view the image. Pressing this button again will return to video.
- Capture: Interrupt the video to save the image without stopping the live video.
- Freeze and capture: Captures the video into an image file and freezes the video. Pressing the probe button again will return to video.

To configure the Fiber Inspection Probe button:

1. From the **Tools** menu, select **Options**.
2. From the **Fiber Probe** tab, check boxes corresponding to the desired behavior.



3. Click **OK** to confirm.

Note: *The capture button on the USB adapter will follow the same setting.*

Changing the Fiber Inspection Probe Tip

You can use various tips depending on the type of connector you are inspecting. For more information about tips you can use, visit the EXFO Web site at www.exfo.com.

To change a tip:

1. Untighten the probe's retaining nut.
2. Remove the tip.
3. Insert a new tip.
4. Adjust the tip to the notch.
5. Retighten the retaining nut.

3 Inspecting Fiber Ends

Inspecting Fiber Ends with the FIP Viewer

You can connect the Fiber Inspection Probe to the FIP Viewer to view and inspect fiber ends.

WARNING

Never look directly into a live fiber. It could cause serious eye damage. Always use your FIP-400 Fiber Inspection Probe.

IMPORTANT

The battery in the FIP Viewer must be fully charged before the first use. For more information, see *Charging the Battery in The FIP Viewer* on page 24.

To inspect fiber ends:

1. Install a probe tip (see *Changing the Fiber Inspection Probe Tip* on page 12).
2. Insert the fiber into the probe tip.
3. Connect the probe to the FIP Viewer.
4. Press the On/Off button for approximately 2 seconds to turn on the FIP Viewer.
5. Adjust the image to have the best view of the fiber end.
6. If the fiber end is dirty, remove it from the probe, clean it and reinspect it.
7. Once you are satisfied with the inspection, go to the next fiber or turn off the FIP Viewer.

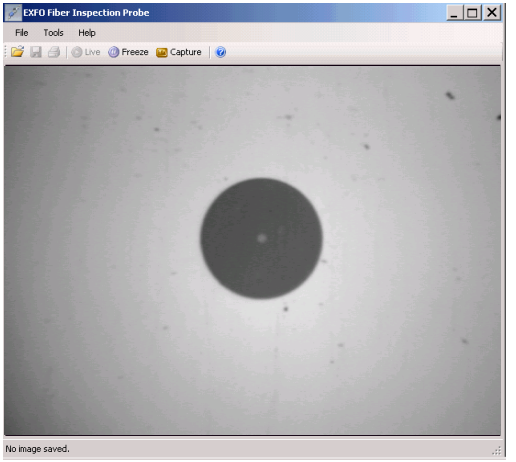
Inspecting Fiber Ends with a Computer

You can connect the Fiber Inspection Probe to a computer via a USB adapter to view and inspect fiber ends.

You must connect the Fiber Inspection Probe to your computer before starting the application. If you start the application before connecting the probe, you will have to restart it for the probe to be detected.

To start the application:

1. Connect your Fiber Inspection Probe to the USB adapter, and then connect the USB adapter to your computer.
2. Install one of the dedicated probe tips to match the connector to inspect (see *Changing the Fiber Inspection Probe Tip* on page 12).
3. Start the Fiber Inspection Probe application from your computer.



To exit the application:

➤ Click ✕.

OR

➤ From the **File** menu, select **Exit**.

WARNING

Never look directly into a live fiber. It could cause serious eye damage. Always use your FIP-400 Fiber Inspection Probe.

To inspect fiber ends:

1. Install a probe tip (see *Changing the Fiber Inspection Probe Tip* on page 12).
2. Insert the fiber into the probe tip.
3. Connect your Fiber Inspection Probe to the USB video adapter, and then connect the USB video adapter to your computer.
4. Start the Fiber Inspection Probe application from your computer.
5. Adjust the image to have the best view of the fiber end.
6. If the fiber end is dirty, remove it from the probe, clean it and reinspect it.
7. Once you are satisfied with the inspection, go to the next fiber or turn off the unit.

Freezing Video

You can freeze the video and save the image you see on screen.

To freeze the video:

➤ From the **Tools** menu, select **Freeze**.

OR

➤ From the toolbar, click **Freeze**.

OR

➤ Press the button on your Fiber Inspection Probe if it has been configured as such (see *Configuring the Fiber Inspection Probe Button* on page 11).

To save the frozen image:

From the main window, select **File**, and then **Save**, or **File**, and then **Save As**.

To return to video:

➤ From the **Tools** menu, select **Live**.

OR

➤ From the toolbar, click **Live**.

OR

➤ Press the button on your probe if it has been configured as such (see *Configuring the Fiber Inspection Probe Button* on page 11).

Capturing Video

You can capture the video into an image directly without stopping or freezing the video.

The application suggests a file name you can use directly or you can modify if needed. For more information, see *Configuring the Default Storage Parameters* on page 9.

To capture video:

1. From the **Tools** menu, select **Capture**.

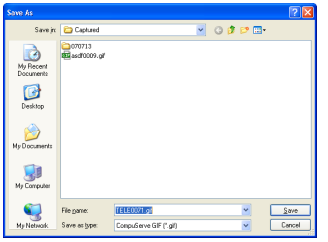
   OR

   From the toolbar, click **Capture**.

   OR

   Press the button on your Fiber Inspection Probe if it has been configured as such (see *Configuring the Fiber Inspection Probe Button* on page 11).

2. In the **Save as** dialog box, use the proposed file name or modify it to save the image.



3. Click **Save**.

Opening and Closing Image Files

You can open captured image files directly from the application.

To open an image file:

1. From the main window, select **File**, and then **Open**.
2. Select the desired file, and then click **Open**.

To close an image file:

From the main window, select **File**, and then **Close**.

Printing Images

You can print images from files that you have previously opened or from video if the image is frozen.

To print images:

1. Open an image file or freeze video.
2. From the main window, select **File**, and then **Print**.

4 Maintenance

To help ensure long, trouble-free operation:

- Keep the unit free of dust.
- Clean the unit casing and front panel with a cloth slightly dampened with water.
- Store unit at room temperature in a clean and dry area. Keep the unit out of direct sunlight.
- Avoid high humidity or significant temperature fluctuations.
- Avoid unnecessary shocks and vibrations.
- If any liquids are spilled on or into the unit, turn off the power immediately and let the unit dry completely.

WARNING

Use of controls, adjustments, and procedures for operation and maintenance other than those specified herein may result in hazardous radiation exposure.

Charging the Battery in The FIP Viewer

The new battery in the FIP Viewer must be fully charged before first use.

To charge the battery:

Connect the AC charger/adapter to the FIP Viewer.

Normal charging time is about 4 hours.

Note: *The FIP Viewer may be used on AC charger/adapter while the batteries are charging.*

Recycling and Disposal (Applies to European Union Only)

Recycle or dispose of your product (including electric and electronic accessories) properly, in accordance with local regulations. Do not dispose of it in ordinary garbage receptacles.

This equipment was sold after August 13, 2005 (as identified by the black rectangle).

- Unless otherwise noted in a separate agreement between EXFO and a customer, distributor or commercial partner, EXFO will cover costs related to the collection, treatment, recovery and disposal of end-of-lifecycle waste generated by electronic equipment introduced after August 13, 2005 to an European Union member state with legislation regarding Directive 2002/96/EC.
- Except for reasons of safety or environmental benefit, equipment manufactured by EXFO, under its brand name, is generally designed to facilitate dismantling and reclamation.

For complete recycling/disposal procedures and contact information, visit the EXFO Web site at www.exfo.com/recycle.

5 Troubleshooting

Solving Common Problem

The table below presents common problems and their solutions.

Problem	Solution
The message indicates that the probe is no longer connected to the USB port.	➤ Verify that the USB adapter has been properly connected to the USB port on your computer. If not, connect the video adapter to the computer USB port, and then click **NO**. Note that the **NO** button must be clicked after the video adapter has been reconnected to the USB port. ➤ After performing the above step, if the same error message is displayed, perform the following: Connect the probe. Close and restart the application. ➤ After performing the above steps, if the same error message is displayed, perform the following: Close the application again. Uninstall the video adapter driver. Restart the computer. The computer may automatically re-install the driver. If not, use the Hardware wizard and the installation CD to reinstall it. Restart the application. ➤ If the problem persists, contact EXFO's technical support group.

Problem	Solution
No video is displayed. OR The video area is gray.	➤ Connect a fiber to the probe. ➤ Connect the probe to the USB adapter. ➤ Ensure that the video is set to live position by clicking **Live** from the main window. ➤ Verify that the probe has been properly connected to the USB adapter. ➤ Ensure that the fiber connector is correctly inserted in the probe tip and the tip in use is correct. ➤ Adjust the focus knob on the probe to see if the video appears and changes with the adjustment. ➤ If the problem persists, contact EXFO's technical support group.

Problem	Solution
The capture button does not work.	➤ The probe capture button works only when selected: From the **Tools** menu, select **Options**. In the **Options** dialog box, select the **Fiber Probe** tab and, then select **Capture** to activate the button on your probe. ➤ After performing the above step, if the capture button still does not work, perform the following: Connect the USB adapter to verify that the button on the USB adapter can freeze/capture video. If so, verify the probe button to see if any foreign object is preventing the probe button from being pushed all the way down. ➤ If neither the button on the USB adapter nor the button on the probe is working, perform the following: Exit the application. Uninstall the USB adapter driver. Restart the computer. Reinstall the USB adapter driver provided in the installation CD. Restart the application. ➤ If the problem persists, contact EXFO's technical support group.

Problem	Solution
The automatic sequential numbering reaches the maximum number.	➤ If you want to keep using the same file name prefix and overwrite the previously saved images: From the **Save As** dialog box, reset the sequential number while keeping the filename prefix unchanged. (If the previously saved image file with the same name has not been deleted and still exists, a message about file overwrite appears.) OR ➤ If you want to keep previously saved images and use a different file name for new sequential numbering: From the **Tools** menu, select **Options**. From **Image File Format**, enter a new prefix. (The new sequential numbers is automatically set to start at 0001.)

Finding Information on the EXFO Web Site

The EXFO Web site provides answers to frequently asked questions (FAQs) regarding the use of your FIP-400 Fiber Inspection Probe.

To access FAQs:

1. Type http://www.exfo.com in your Internet browser.
2. Click the **Support** tab.
3. Click **FAQs** and follow the on-screen instructions. You will be given a list of questions pertaining to your subject.

The EXFO Web site also provides the product's most recent technical specifications.

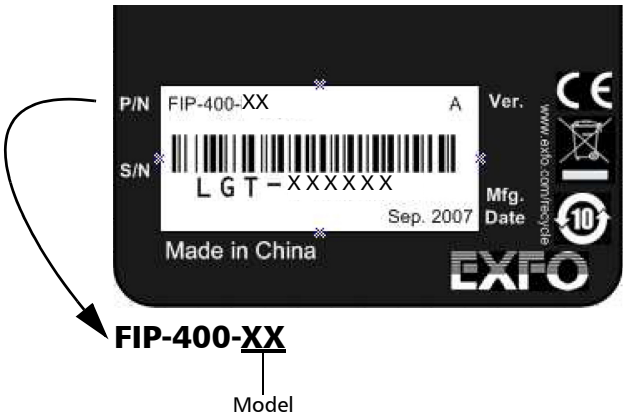
Contacting the Technical Support Group

To obtain after-sales service or technical support for this product, contact EXFO at one of the following numbers. The Technical Support Group is available to take your calls from Monday to Friday, 7:30 a.m. to 8:00 p.m. (Eastern Time in North America).

Technical Support Group
400 Godin Avenue
Quebec (Quebec) G1M 2K2
CANADA

1 866 683-0155 (USA and Canada)
Tel.: 1 418 683-5498
Fax: 1 418 683-9224
support@exfo.com

To accelerate the process, please have information such as the name and the serial number (see the product identification label—an example is shown below), as well as a description of your problem, close at hand.



Transportation

Maintain a temperature range within specifications when transporting the unit. Transportation damage can occur from improper handling. The following steps are recommended to minimize the possibility of damage:

- Pack the unit in its original packing material when shipping.
- Avoid high humidity or large temperature fluctuations.
- Keep the unit out of direct sunlight.
- Avoid unnecessary shocks and vibrations.

6 Warranty

General Information

EXFO Electro-Optical Engineering Inc. (EXFO) warrants this equipment against defects in material and workmanship for a period of one year from the date of original shipment. EXFO also warrants that this equipment will meet applicable specifications under normal use.

During the warranty period, EXFO will, at its discretion, repair, replace, or issue credit for any defective product, as well as verify and adjust the product free of charge should the equipment need to be repaired or if the original calibration is erroneous. If the equipment is sent back for verification of calibration during the warranty period and found to meet all published specifications, EXFO will charge standard calibration fees.

IMPORTANT

The warranty can become null and void if:

- **unit has been tampered with, repaired, or worked upon by unauthorized individuals or non-EXFO personnel.**
- **warranty sticker has been removed.**
- **case screws, other than those specified in this guide, have been removed.**
- **case has been opened, other than as explained in this guide.**
- **unit serial number has been altered, erased, or removed.**
- **unit has been misused, neglected, or damaged by accident.**

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL EXFO BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

Liability

EXFO shall not be liable for damages resulting from the use of the product, nor shall be responsible for any failure in the performance of other items to which the product is connected or the operation of any system of which the product may be a part.

EXFO shall not be liable for damages resulting from improper usage or unauthorized modification of the product, its accompanying accessories and software.

Exclusions

EXFO reserves the right to make changes in the design or construction of any of its products at any time without incurring obligation to make any changes whatsoever on units purchased. Accessories, including but not limited to fuses, pilot lamps, batteries and universal interfaces (EUI) used with EXFO products are not covered by this warranty.

This warranty excludes failure resulting from: improper use or installation, normal wear and tear, accident, abuse, neglect, fire, water, lightning or other acts of nature, causes external to the product or other factors beyond EXFO's control.

IMPORTANT

EXFO will charge a fee for replacing optical connectors that were damaged due to misuse or bad cleaning.

Certification

EXFO certifies that this equipment met its published specifications at the time of shipment from the factory.

Service and Repairs

EXFO commits to providing product service and repair for five years following the date of purchase.

To send any equipment for service or repair:

1. Call one of EXFO's authorized service centers (see *EXFO Service Centers Worldwide* on page 36). Support personnel will determine if the equipment requires service, repair, or calibration.
2. If equipment must be returned to EXFO or an authorized service center, support personnel will issue a Return Merchandise Authorization (RMA) number and provide an address for return.
3. If possible, back up your data before sending the unit for repair.
4. Pack the equipment in its original shipping material. Be sure to include a statement or report fully detailing the defect and the conditions under which it was observed.
5. Return the equipment, prepaid, to the address given to you by support personnel. Be sure to write the RMA number on the shipping slip. *EXFO will refuse and return any package that does not bear an RMA number.*

Note: *A test setup fee will apply to any returned unit that, after test, is found to meet the applicable specifications.*

After repair, the equipment will be returned with a repair report. If the equipment is not under warranty, you will be invoiced for the cost appearing on this report. EXFO will pay return-to-customer shipping costs for equipment under warranty. Shipping insurance is at your expense.

Routine recalibration is not included in any of the warranty plans. Since calibrations/verifications are not covered by the basic or extended warranties, you may elect to purchase FlexCare Calibration/Verification Packages for a definite period of time. Contact an authorized service center (see *EXFO Service Centers Worldwide* on page 36).

EXFO Service Centers Worldwide

If your product requires servicing, contact your nearest authorized service center.

EXFO Headquarters Service Center
400 Godin Avenue
Quebec (Quebec) G1M 2K2
CANADA

1 866 683-0155 (USA and Canada)
Tel.: 1 418 683-5498
Fax: 1 418 683-9224
quebec.service@exfo.com

EXFO Europe Service Center
Omega Enterprise Park, Electron Way
Chandlers Ford, Hampshire S053 4SE
ENGLAND

Tel.: +44 2380 246810
Fax: +44 2380 246801
europe.service@exfo.com

EXFO China Service Center/
Beijing OSIC
Beijing New Century Hotel
Office Tower, Room 1754-1755
No. 6 Southern Capital Gym Road
Beijing 100044
P. R. CHINA

Tel.: +86 (10) 6849 2738
Fax: +86 (10) 6849 2662
beijing.service@exfo.com

A Technical Specifications

IMPORTANT

The following technical specifications can change without notice. The information presented in this section is provided as a reference only. To obtain this product's most recent technical specifications, visit the EXFO Web site at *www.exfo.com*.

Video Inspection Probe		
Size (L x W x H)	170 mm x 32 mm x 38.5 mm (without tip cap) 200 mm x 32 mm x 38.5 mm (with tip cap)	
Weight	0.2 kg (0.44 lb)	
Camera type	0.25 in CCD	
Resolution	Theoretical < 2 µm, detection capability < 1 µm	
Field of view	0.625 µm x 0.464 µm (low magnification) 0.412 µm x 0.316 µm (high magnification)	
Light source	Blue LED	
Lighting technique	Coaxial	
Capture button	Present on all models (works with USB2.0 or EXFO instruments)	
Connector	EXFO probe port type (8 pin mini-DIN)	
Focus control	Adjustable on the probe	
Optical magnification	Adjustable, low and high (dual model only)	
Fiber Probe Viewer	Blue LED, internal to probe	
Size (L x W x H)	190 mm x 99 mm x 50 mm	
Weight [a]	0.3 kg (0.66 lb)	
LCD	3.5 in TFT active matrix (320 x 240 pixels)	
Power	Rechargeable Li-ion battery or AC adapter/charger 110 or 240 VAC–9VDC at 1 A	
Battery life	3 hours (continuous use)	
Charging time	4 hours	
Connector	EXFO probe port type (8 pin mini-DIN)	
USB Converter	**USB 1.1 model**	**USB 1.2.0 model**
Size (L x W x H)	90 mm x 36 mm x 20 mm	95 mm x 36 mm x 19 mm
Connectors	EXFO probe port type (8 pin mini-DIN)/USB	
Capture button	NO	YES

Note

a. Without battery

GENERAL SPECIFICATIONS		
Temperature		
	operating	–10 to 50 oC
	storage	–40 to 70 oC
Relative humidity		0 % to 95 % non-condensing

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